

**TRANSMITTAL
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Total Number of Pages in This Submission

45

Application Number

10/018,112

Filing Date

December 14, 2001

First Named Inventor

Petersdorf, Effie W.

Art Unit

Not yet assigned

Examiner Name

Not yet assigned

Attorney Docket Number

14538A-005210US

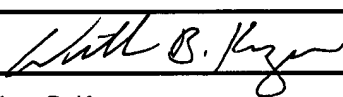
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Remarks

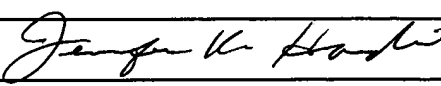
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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

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|--------------|---|----------|--------|
| Firm Name | Townsend and Townsend and Crew LLP | | |
| Signature |  | | |
| Printed name | William B. Kezer | | |
| Date | 5.11.05 | Reg. No. | 37,369 |

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| Typed or printed name | Jennifer K. Hardin | Date | 5/11/05 |

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PTO/SB/21 (08-00)

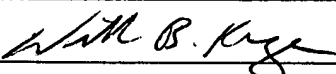
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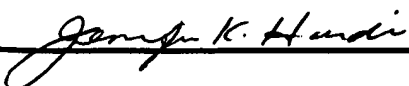
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| TRANSMITTAL FORM <i>(to be used for all correspondence after initial filing)</i> | Application Number | PCT/US00/16722 | |
| | Filing Date | June 16, 2000 | |
| | First Named Inventor | Petersdorf, Effie W. | |
| | Group Art Unit | Not yet assigned | |
| | Examiner Name | Not yet assigned | |
| Total Number of Pages in This Submission | 42 | Attorney Docket Number | 14538A-005210US |

| ENCLOSURES (check all that apply) | | |
|---|---|--|
| <input checked="" type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment / Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input checked="" type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/ Incomplete Application <input checked="" type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53 | <input type="checkbox"/> Assignment Papers (for an Application) <input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) | <input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): Return Postcard Copy of Notice to be returned Communication and Preliminary Amendment Sequence Listing (computer readable copy and paper copy) Declarations |
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| SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT | |
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| Firm and Individual name | Townsend and Townsend and Crew LLP William B. Kezer Reg. No. 37,369 |
| Signature |  |
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On 10/21/02

TOWNSEND and TOWNSEND and CREW LLP

By: Janice K. Hendri

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

PETERSDORF *et al.*

Application No.: PCT/US00/16722

Filed: June 16, 2000

For: OLIGONUCLEOTIDE ARRAYS
FOR HIGH RESOLUTION HLA
TYPING

Examiner: Not yet assigned

Art Unit: Not yet assigned

COMMUNICATION UNDER

37 C.F.R. §§ 1.821-1.825

AND

PRELIMINARY AMENDMENT

U.S. Patent and Trademark Office Box PCT
Commissioner for Patents
Washington, D. C. 20231

Sir:

In response to the request to comply with Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures, 37 C.F.R. §§ 1.821-1.825, that accompanied the Notification of Missing Requirements Under 35 U.S.C. 371 in the United States Designated/Elected Office (DO/EO/US) mailed March 22, 2002, Applicants submit herewith the required paper copy and computer readable copy of the Substitute Sequence Listing. Please amend the specification in adherence with 37 C.F.R. §§ 1.821-1.825 as follows.

In the Specification:

Please replace the paragraph beginning at page 15, line 9, with the following:

--The longer chain portion can be any of a variety of molecules which are inert to the subsequent conditions necessary for attaching the oligonucleotide probes, or for hybridization of a sample to the probe array. These longer chain portions will typically be ethylene glycol oligomers containing 2-14 monomer units, diamines, diacids, amino acids, peptides, or combinations thereof. In some embodiments, the longer chain portion is a polynucleotide (*e.g.*, a 15-mer of poly dT; SEQ ID NO:141). Additionally, for use in synthesis of the probe arrays, the linking group will typically have a protecting group, attached to a functional group (*i.e.*, hydroxyl, amino or carboxylic acid) on the distal or terminal end of the chain portion (opposite the solid support). After deprotection and coupling, the distal end is covalently bound to an oligonucleotide probe (*e.g.*, an HLA Class I oligonucleotide probe).--

Please replace the paragraph beginning at page 16, line 24, with the following:

--The length of the spacer between the support and the hybridization sequence influences the efficiency of hybridization (Guo et al, *Nuc. Acids Res.* 22:5456-5465 (1994)). When large DNA fragments, such as PCR products, are allowed to hybridize with short oligonucleotide probes immobilized on solid supports, adequate distance between the hybridization sequence and the solid surface is required in order to achieve the efficient hybridization. This is due to the steric interference between large DNA molecules and the support. Within one embodiment of the invention, a 15-mer dT spacer (SEQ ID NO:141) was employed in each oligonucleotide probe to provide adequate space between hybridization sequence and the support. Although requiring extra expense in oligonucleotide synthesis, the 15-mer spacer was essential to optimize hybridization signals. Each completed probe contained a 5' amino group for

immobilization chemistry, a 20-nucleotide hybridization sequence, and a 15-mer dT spacer (SEQ ID NO:141) between them.--

Please replace the paragraph beginning at page 28, line 3, with the following:

--Once the solid support has been suitably derivatized, a linking group is attached to provide a spacing between the oligonucleotide probe and the support which is optimized for interactions between the probes and the sample. As provided above, a variety of linking groups can be used in this aspect of the invention. Preferred groups are those that provide a spacing similar to that provided by a 15-mer poly dT spacing group (SEQ ID NO:141). Additionally, the linking group will have a reactive portion that is selected to be compatible with the amino group of the aminoalkylsilane-derivatized support, or with the functional group present on the reagent used to facilitate linking group attachment (*e.g.*, the isothiocyanate portion of 1,4-phenylenediisothiocyanate). Accordingly, at the proximal end (that forming an attachment closest to the support), the linking group will have a functional group that is reactive with an amino moiety (*e.g.*, a carboxylic acid, anhydride, isothiocyanate, and the like) or a functional group that is reactive with an isocyanate, isothiocyanate or carboxylic acid moiety (*e.g.*, an amino group, a hydroxyl group or the like).--

Please replace the paragraph beginning at page 28, line 17, with the following:

--In a particularly preferred embodiment, the support is derivatized first with aminopropyltrimethoxysilane, followed by attachment of 1,4-phenylenediisothiocyanate, followed by attachment of a 15-mer oligonucleotide, preferably a 15-mer of poly-dT (SEQ ID NO:141).--

Please replace the paragraph beginning at page 37, line 1, with the following:

--Exon 2 of HLA-B gene was amplified by two-step asymmetric PCR. In the first step, the PCR primers were Exon 2 5'-primer (5'-GCTCCCACTCCATGAGGTAT-3'; SEQ ID NO:71) and Exon 2 3'-primer (5'-CGGCCTCGCTCTGGTTGTAG-3'; SEQ ID NO:138). The one hundred microliter amplification reaction contained 50 mM KCl, 10 mM Tris-HCl, 1.5 mg MgCl₂, 10 mg of gelatin, 20 ng of genomic DNA, 2 microMoles of each primer, 200 microMoles each of dATP, dCTP, dTTP and dGTP, and 2.5 U of Taq DNA polymerase. The amplification reaction was performed in a Perkin-Elmer Cetus 9600 thermal cycler using 35 cycles of the following profile: 94°C for 30 seconds, 60°C for 1 minute and 72°C for 1 minute. The PCR mixture was then purified using a QIAGEN PCR purification kit (QIAGEN Inc., Chatsworth, CA) to remove the excess primers. In the second step, the PCR primer employed was a 5' Rhodamine-labeled Exon 2 3'-primer (SEQ ID NO:138). The PCR was performed in 30 cycles using the following profile: 94°C for 30 seconds, 60°C for 1 minute and 72°C for 2 minutes.--

Please replace the paragraph beginning at page 37, line 14, with the following:

--Amplification of exon 3 of HLA-B was accomplished using Exon 3 5'-primer (5'-ACCCGGTTTCATTTTCAGTTG-3'; SEQ ID NO:139) and Exon 3 3'-primer (5'-CCCACTGCCCCTGGTACC-3'; SEQ ID NO:140). The amplification reaction was performed in 35 cycles of the following profile: 94°C for 30 seconds, 65°C for 1 minute and 72°C for 1 minute. To generate single-strand exon 3 product, the second PCR was performed, employing a 5' Rhodamine-labeled 3 3'-primer (SEQ ID NO:140), in 30 cycles of the following profile: 94°C for 1 minute, 65°C for 1 minute and 72°C for 2 minutes.--

Please cancel the present "SEQUENCE LISTING", pages 1-39, and insert therefor the accompanying paper copy of the Substitute Sequence Listing, page numbers 1 to 27, at the end of the application.

REMARKS

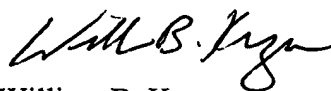
Applicants request entry of this amendment in adherence with 37 C.F.R. §§1.821 to 1.825. This amendment is accompanied by a floppy disk containing the above named sequences, SEQ ID NOS:1-141, in computer readable form, and a paper copy of the sequence information which has been printed from the floppy disk.

The information contained in the computer readable disk was prepared through the use of the software program "FastSEQ" and is identical to that of the paper copy. This amendment contains no new matter.

Attached hereto is a marked-up version of the changes made to the Specification by the current Amendment. The attached pages are captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE.**"

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,



William B. Kezer
Reg. No. 37,369

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, 8th Floor
San Francisco, California 94111-3834
Tel: 415-576-0200
Fax: (415) 576-0300
WBK:dmw
SF 1397486 v1

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

Paragraph beginning at line 9 of page 15 has been amended as follows:

The longer chain portion can be any of a variety of molecules which are inert to the subsequent conditions necessary for attaching the oligonucleotide probes, or for hybridization of a sample to the probe array. These longer chain portions will typically be ethylene glycol oligomers containing 2-14 monomer units, diamines, diacids, amino acids, peptides, or combinations thereof. In some embodiments, the longer chain portion is a polynucleotide (*e.g.*, a 15-mer of poly dT; SEQ ID NO:141). Additionally, for use in synthesis of the probe arrays, the linking group will typically have a protecting group, attached to a functional group (*i.e.*, hydroxyl, amino or carboxylic acid) on the distal or terminal end of the chain portion (opposite the solid support). After deprotection and coupling, the distal end is covalently bound to an oligonucleotide probe (*e.g.*, an HLA Class I oligonucleotide probe).

Paragraph beginning at line 24 of page 16 has been amended as follows:

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adequate space between hybridization sequence and the support. Although requiring extra expense in oligonucleotide synthesis, the 15-mer spacer was essential to optimize hybridization signals. Each completed probe contained a 5' amino group for immobilization chemistry, a 20-nucleotide hybridization sequence, and a 15-mer dT spacer (SEQ ID NO:141) between them.

Paragraph beginning at line 3 of page 28 has been amended as follows:

Once the solid support has been suitably derivatized, a linking group is attached to provide a spacing between the oligonucleotide probe and the support which is optimized for interactions between the probes and the sample. As provided above, a variety of linking groups can be used in this aspect of the invention. Preferred groups are those that provide a spacing similar to that provided by a 15-mer poly dT spacing group (SEQ ID NO:141). Additionally, the linking group will have a reactive portion that is selected to be compatible with the amino group of the aminoalkylsilane-derivatized support, or with the functional group present on the reagent used to facilitate linking group attachment (*e.g.*, the isothiocyanate portion of 1,4-phenylenediisothiocyanate). Accordingly, at the proximal end (that forming an attachment closest to the support), the linking group will have a functional group that is reactive with an amino moiety (*e.g.*, a carboxylic acid, anhydride, isothiocyanate, and the like) or a functional group that is reactive with an isocyanate, isothiocyanate or carboxylic acid moiety (*e.g.*, an amino group, a hydroxyl group or the like).

Paragraph beginning at line 17 of page 28 has been amended as follows:

In a particularly preferred embodiment, the support is derivatized first with aminopropyltrimethoxysilane, followed by attachment of 1,4-phenylenediisothiocyanate, followed by attachment of a 15-mer oligonucleotide, preferably a 15-mer of poly-dT (SEQ ID NO:141).

Paragraph beginning at line 1 of page 37 has been amended as follows:

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Paragraph beginning at line 14 of page 37 has been amended as follows:

Amplification of exon 3 of HLA-B was accomplished using Exon 3 5'-primer (5'-ACCCGGTTTCATTTTCAGTTG-3'; SEQ ID NO:139-~~SEQ ID NO:140~~) and Exon 3 3'-primer (5'-CCCACTGCCCCTGGTACC-3'; SEQ ID NO:140-~~SEQ ID NO:141~~). The amplification reaction was performed in 35 cycles of the following profile: 94°C for 30 seconds, 65°C for 1 minute and 72°C for 1 minute. To generate single-strand exon 3 product, the second PCR was performed, employing a 5' Rhodamine-labeled 3 3'-primer (SEQ ID NO:140)-(~~SEQ ID NO:141~~), in 30 cycles of the following profile: 94°C for 1 minute, 65°C for 1 minute and 72°C for 2 minutes-minute.



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U.S. APPLICATION NUMBER NO.

10/018,112

FIRST NAMED APPLICANT

Effie W. PETERSDORF

ATTY. DOCKET NO.

14538A-005210

INTERNATIONAL APPLICATION NO.

PCT/US00/16722

I.A. FILING DATE

06/16/2000

PRIORITY DATE

06/17/1999

William B Kezer
 Townsend and Townsend and Crew
 2 Embarcadero Center
 8th Floor
 San Francisco, CA 94111

CONFIRMATION NO. 1480

371 FORMALITIES LETTER

OC000000015718115

OC000000015718115

Response Due**NO EXTENSIONS**

Date Mailed: 04/12/2005

NOTIFICATION OF DEFECTIVE RESPONSE

The following items have been submitted by the applicant or the IB to the United States Patent and Trademark Office as a Designated / Elected Office (37 CFR 1.495)

- Priority Document
- Copy of the International Application filed on 12/14/2001
- Copy of the International Search Report filed on 12/14/2001
- Copy of IPE Report filed on 12/14/2001
- Preliminary Amendments filed on 10/28/2002
- Oath or Declaration filed on 10/28/2002
- Biochemical Sequence Listing filed on 10/28/2002
- Request for Immediate Examination filed on 12/14/2001
- U.S. Basic National Fees filed on 12/14/2001

Applicant's response filed 10/28/2002 is hereby acknowledged. The following requirements set forth in the NOTIFICATION of MISSING REQUIREMENTS mailed 03/22/2002 have not been completed.

- This application clearly fails to comply with the requirements of 37 CFR. 1.821-1.825. Applicant's attention is directed to the final rulemaking notice published at 55 FR 18230 (May 1, 1990), and 1114 OG 29 (May 15, 1990). If the effective filing date is on or after July 1, 1998, see the final rulemaking notice published at 63 FR 29620 (June 1, 1998) and 1211 OG 82 (June 23, 1998). If the effective filing date is on or after September 8, 2000, see the final rulemaking notice published in the Federal Register at 65 FR 54604 (September 8, 2000) and 1238 OG 145 (September 19, 2000). Applicant must provide an initial computer readable form (CRF) copy of the "Sequence Listing", an initial paper or compact disc copy of the "Sequence Listing", as well as an amendment directing its entry into the application. Applicant must also provide a statement that the content of the sequence listing information recorded in computer readable form is identical to the written (on paper or compact disc) sequence listing and, where applicable, includes no new matter, as required by 37 CFR 1.821(e), 1.821(f), 1.821(g), 1.825(b), or 1.825(d). If applicant desires the sequence listing in the instant application to be identical with that of another application on file in the U.S. Patent and Trademark Office, such request in accordance with 37 CFR 1.821(e) may be submitted in lieu of a new CRF.
- The paper or compact disc copy of the "Sequence Listing" is not the same as the computer readable form of the "Sequence Listing" as required by 37 CFR 1.821(e). Applicant must provide a substitute paper or compact disc copy of the "Sequence Listing", as well as an amendment directing its entry into the

application OR a substitute computer readable form (CRF) copy of the "Sequence Listing". These two items must be the same. Applicant must also provide a statement that the content of the sequence listing information recorded in computer readable form is identical to the written (on paper or compact disc) sequence listing and, where applicable, includes no new matter, as required by 37 CFR 1.821(e), 1.821(f), 1.821(g), 1.825(b), or 1.825(d). If the effective filing date is on or after September 8, 2000, see the final rulemaking notice published in the Federal Register at 65 FR 54604 (September 8, 2000) and 1238 OG 145 (September 19, 2000).

- A copy of the "Sequence Listing" in computer readable form has not been submitted as required by 37 CFR 1.821(e). If the effective filing date is on or after September 8, 2000, see the final rulemaking notice published in the Federal Register at 65 FR 54604 (September 8, 2000) and 1238 OG 145 (September 19, 2000). Applicant must provide an initial computer readable form (CRF) copy of the "Sequence Listing" and a statement that the content of the sequence listing information recorded in computer readable form is identical to the written (on paper or compact disc) sequence listing and, where applicable, includes no new matter, as required by 37 CFR 1.821(e), 1.821(f), 1.821(g), 1.825(b), or 1.825(d). If applicant desires the sequence listing in the instant application to be identical with that of another application on file in the U.S. Patent and Trademark Office, such request in accordance with 37 CFR 1.821(e) may be submitted in lieu of a new CRF.

Applicant is required to complete the response within a time limit of ONE MONTH from the date of this Notification or within the time remaining in the response set forth in the Notification of Missing Requirements, whichever is the longer. No extension of this time limit may be granted under 37 CFR 1.136, but the period for response set in the Notification of Missing Requirements may be extended under 37 CFR 1.136(a).

For questions regarding compliance to 37 CFR 1.821-1.825 requirements, please contact:

- For Rules Interpretation, call (571) 272-0951
- For Patentin Software Program Help, call Patent EBC at 1-866-217-9197 or directly at 703-305-3028 / 703-308-6845 between the hours of 6 a.m. and 12 midnight, Monday through Friday, EST.
- Send e-mail correspondence for Patentin Software Program Help @ ebc@uspto.gov

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

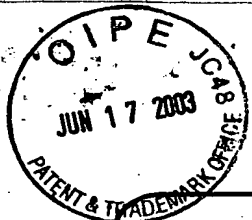
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FRANCINE YOUNG

Telephone: (703) 308-9140 EXT 215

PART 1 - ATTORNEY/APPLICANT COPY

| U.S. APPLICATION NUMBER NO. | INTERNATIONAL APPLICATION NO. | ATTY. DOCKET NO. |
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| 10/018,112 | PCT/US00/16722 | 14538A-005210 |



PET/US00/16722-17062003

Approved for use through 04/30/2003. OMB 0651-0031
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| TRANSMITTAL FORM (to be used for all correspondence after initial filing) | Application Number | 10/018,112 / PCT/US00/16722 | |
| | Filing Date | June 16, 2000 | |
| | First Named Inventor | Petersdorf, Effie W. | |
| | Art Unit | Not yet assigned | |
| | Examiner Name | Not yet assigned | |
| Total Number of Pages in This Submission | 3 | Attorney Docket Number | 14538A-005210US |

ENCLOSURES (Check all that apply)

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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

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| Firm or Individual | Townsend and Townsend and Crew LLP William B. Kezer | Reg. No. 37,369 |
| Signature | | |
| Date | 6-12-03 | |

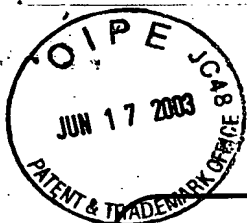
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| TRANSMITTAL FORM (to be used for all correspondence after initial filing) | Application Number | 10/018,112 / PCT/US00/16722 | |
| | Filing Date | June 16, 2000 | |
| | First Named Inventor | Petersdorf, Effie W. | |
| | Art Unit | Not yet assigned | |
| | Examiner Name | Not yet assigned | |
| Total Number of Pages in This Submission | 3 | Attorney Docket Number | 14538A-005210US |

| ENCLOSURES (Check all that apply) | | |
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| Firm or Individual | Townsend and Townsend and Crew LLP William B. Kezer | Reg. No. 37,369 |
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